DESCRIPTION • OPERATION • INSTALLATION

INSTRUCTIONS

TYPE MW-31 and MW-41 OVERLOAD RELAYS

For Use With

Sizes 3 and 4 Life-Line® Starters

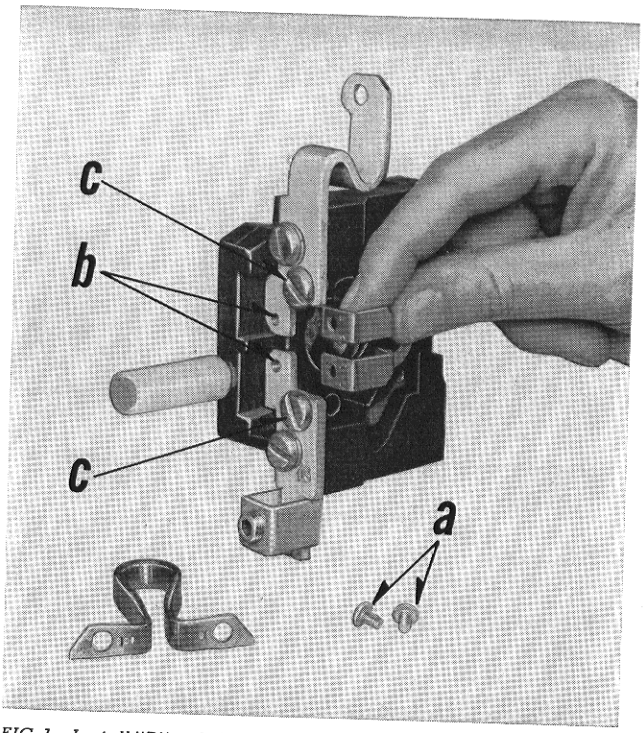

FIG. 1. Install "B" code heater in the relay, using screws "a" threaded into holes "b". The "C" code heater (shown below relay) is held by larger screws "c". Be sure the looped portion enters the recess in the relay.

THE TYPE MW-31 OVERLOAD RELAY is designed for the Size 3 Life-Line Starter, while the MW-41 Overload Relay is designed for the Size 4 Life-Line Starter. It is the purpose of these relays to detect and then protect a load from overloading currents by automatically disconnecting the power. The performance of the relays are such that they will allow motor starting currents to flow during the starting period, but will trip when subject to smaller but long-continued overloads. They will provide protection against abnormal load conditions to current values exceeding locked rotor current.

The MW relays feature a bi-metallic disc which insures the same accuracy and uniformity obtained in precision thermostats. This convex bi-metallic disc after heating snaps to reverse its convexity, thus insuring a quick-break action of the contacts.

In accordance with the National Electric Code the relay should be protected against short circuits by fuses rated at not more than four times the rated motor current, or by a time limit circuit breaker set at not more than four times the rated motor current.

Ratings. The MW-31 and MW-41 relays are used on circuits of not more than 600 volts, and have contacts which will carry and break a-c currents of the contactor coil up to 2 amperes. The contacts will also handle 50 volt-amperes at a maximum of 1 ampere in a d-c circuit. With heaters properly selected from the heater application table, the relays may be used on circuits from 14.2 to 173 amperes. For special applications there are heaters available for circuits of lower and higher ratings.

The time required for the relay to trip depends upon the size of the overload, the greater the overload the shorter being the time to trip. This is indicated in the Time Characteristic Curve, Fig. 2, of a relay operating in a 40°C. (104°F.) ambient temperature. The curve applies in general when the relay is operated in any ambient temperature as long as the currents are expressed in percentages of the minimum tripping current at that ambient temperature. The minimum tripping current changes with the ambient temperature in approximately the same ratio as the change in load capacity of the motor.

OPERATION

The MW overload relay has a heater (a calibrated resistor element) placed in series with the load. During an overload

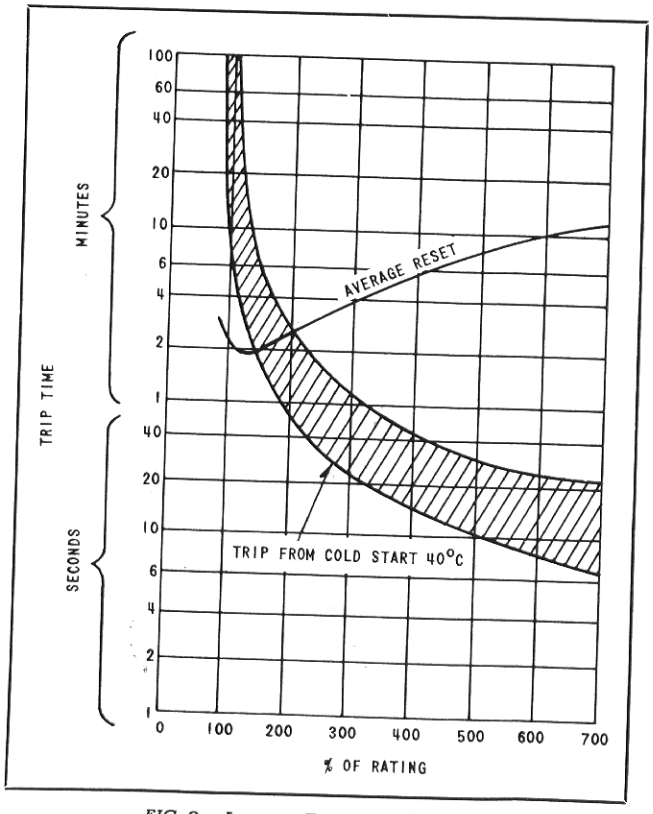

FIG. 2. Average Time Current Curve

® Registered Trade-Mark.

HEATER APPLICATION TABLE

HEATERS		OPEN				LARGE ENCLOSURES				UNIT ENCLOSURES			
CODE MARKING	STYLE NUMBER	MW-31 Table K I.S. 12619	FULL LOAD CURRENT OF MOTOR 125% Overload Protection AMPERES	CURRENT RATING AT 40°C ROOM TEMP. AMPERES	MW-41 Table N I.S. 12622	MW-31 Table L I.S. 12620	FULL LOAD CURRENT OF MOTOR 125% Overload Protection AMPERES	CURRENT RATING AT 40°C ROOM TEMP. AMPERES	MW-41 Table P I.S. 12623	MW-31 Table M I.S. 12621	FULL LOAD CURRENT OF MOTOR 125% Overload Protection AMPERES	CURRENT RATING AT 40°C ROOM TEMP. AMPERES	MW-41 Table S I.S. 12624
BF 16	966 493	X	14.2 to 15.7	17.7	X	X	13.2 to 14.6	16.5	X	X	12.8 to 14.2	16.0	X
BG 18	966 494	X	15.8 to 17.2	19.7	X	X	14.7 to 16.0	18.3	X	X	14.3 to 15.5	17.8	X
BH 19	966 495	X	17.3 to 18.7	21.6	X	X	16.1 to 17.4	20.1	X	X	15.6 to 16.9	19.5	X
BI 21	966 496	X	18.8 to 20.5	23.4	X	X	17.5 to 19.1	21.8	X	X	17.0 to 18.5	21.2	X
BK 23	966 497	X	20.6 to 22.0	25.7	X	X	19.2 to 20.5	23.9	X	X	18.6 to 19.9	23.2	X
BL 25	966 498	X	22.1 to 23.9	27.6	X	X	20.6 to 22.3	25.7	X	X	20.0 to 21.5	24.9	X
BM 27	966 499	X	24.0 to 26.3	30	X	X	22.4 to 24.7	28	X	X	21.6 to 23.9	27	X
BO 31	974 084	X	26.4 to 30.3	33	X	X	24.8 to 27.9	31	X	X	24.0 to 27.1	30	X
BP 32	301P138G01	X	30.4 to 33.5	38	X	X	28.0 to 31.1	35	X	X	27.2 to 30.3	34	X
BQ 35	301P139G01	X	33.6 to 36.7	42	X	X	31.2 to 34.3	39	X	X	30.4 to 32.7	38	X
CR	1780 725	X	36.8 to 41.5	46	X	X	34.4 to 38.3	43	X	X	32.8 to 36.7	41	X
CS	1780 726	X	41.6 to 47.9	52	X	X	38.4 to 44.7	48	X	X	36.8 to 42.3	46	X
BU 54	1265 537	X	48.0 to 55.9	60	X	X	44.8 to 51.9	56	X	X	42.4 to 49.5	53	X
BX 61	1265 538	X	56.0 to 64.7	70	X	X	52.0 to 59.9	65	X	X	49.6 to 57.5	62	X
BY 65	1265 539	X	64.8 to 75.1	81	X	X	60.0 to 69.5	75	X	X	57.6 to 66.3	72	X
CA	1597 771	X	75.2 to 83.1	94	X	X	69.6 to 76.7	87	X	X	66.4 to 73.5	83	X
CB	1597 772	X	83.2 to 91.9	104	X	X	76.8 to 84.7	96	X	X	73.6 to 80.7	92	X
CC	1597 773	X	92 to 103	115	X	X	84.8 to 94.3	106	X	X	80.8 to 90.3	101	X
CD	1597 774		104 to 115	129	X	X	94.4 to 106	118	X	X	90.4 to 101	113	X
CE	1597 775		116 to 121	145	X		107 to 111	133	X		102 to 106	127	X
CF	1597 776		122 to 128	152	X		112 to 118	139	X		107 to 112	133	X
CG	1597 777		129 to 137	161	X		119 to 126	148	X		113 to 119	141	X
CH	1597 778		138 to 150	172	X		127 to 134	158	X		120 to 127	150	X
CI	1597 779						135 to 150	168	X		128 to 138	160	X
CJ	1597 780										139 to 150	173	X

X Indicates heater is used on this relay size

the flow of heat from the heater causes an adjacent convex bi-metallic disc at a definite temperature to suddenly snap, reversing its convexity. The movement of the disc opens double-break silvered contacts connected in series with the operating coil of the contactor, and thus disconnects the power from the load. Once the heater and bi-metallic disc cool sufficiently the disc will snap back to its original shape. The contacts are now free to close, except for action of a push-rod. The relay is designed to operate these contacts in any one of three positions, "Auto", "Hand", and "No Stop". The position of the control spring in the notched push-rod controls the action of the push-rod.

When the spring is in the "Hand" position at the time the bi-metal snaps open the contacts, the "Reset-Stop" push-rod moves to engage and retain the contacts in the open position. After the disc has cooled the push-rod may be depressed to reset the contacts to the closed position. The push-rod may also serve as a stop button by depressing it further to open the contacts.

The "No Stop" position of the spring is similar to the "Hand" position except that the push-rod cannot be depressed as a stop button.

When the spring is in the "Auto" (Automatic) position the push-rod is prevented from holding the contacts in the open position, hence when the disc cools off the contacts will automatically close and re-energize the circuits. The push-rod again may serve as a stop button.

INSTALLATION

The heater is supplied separately, and is to be mounted as indicated in Fig. 1.

Set the control spring at "Auto", "Hand", or "No Stop", as desired. DO NOT use the "No Stop" setting if the push-rod is to be used as part of a built-in or local stop button.

All connections must be clean and tight.

For relay without main terminals order S# 456D918G16.

HEATERS

Each heater is identified by a code marking stamped on one terminal near the mounting hole. The Heater Application Table indicates the range of full load motor current to which a given heater may be applied on a Size 3 or Size 4 Life-Line starter. This range is so selected that the current to produce ultimate tripping of the relay will be approximately 115% to 125% of the rated motor current.

These tables are based on motors having 40°C continuous ratings. For 50°C or 55°C motors, select heaters approximately one size smaller, but always with a rating higher than the full load motor amperes. When the room temperature surrounding the motor exceeds that at the starter, assume a decreased motor current of 1% for each degree C difference in temperature and select heaters accordingly. When the room temperature at the starter exceeds that at the motor, assume an increased motor current of 1% for each degree C difference in temperature and select heaters accordingly.

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